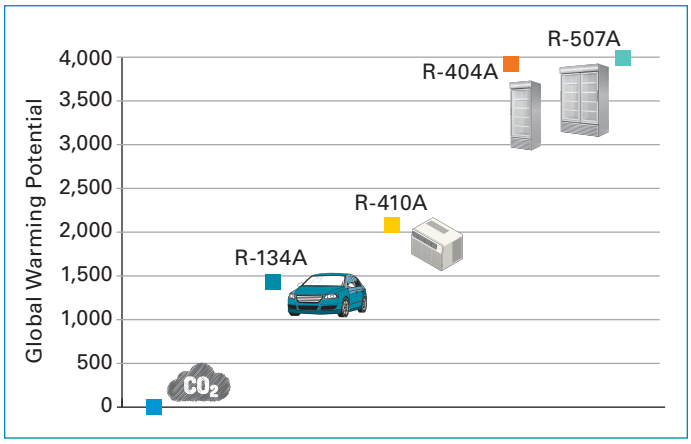
REDUCING HFC EMISSIONS
in the Federal Sector

What are HFCs?

Hydrofluorocarbons (HFCs) are extremely potent greenhouse gases (GHGs) commonly used in refrigerators, air conditioners, and a variety of other applications within federal facilities (see Figure 1). The use and emissions of HFCs are growing rapidly as they are increasingly adopted as replacements for ozone-depleting substances (ODS) being phased out under the Clean Air Act and as economic growth spurs demand for new equipment, especially in the refrigeration/air-conditioning (AC) sector. President Obama's Climate Action Plan (CAP)— announced in June 2013—calls for international and domestic action to reduce GHGs, including high-global warming potential (GWP) HFCs. Among other things, the CAP calls for his Administration to transition to equipment that uses safer and more sustainable alternatives to HFCs.

Figure 1: Key HFC Refrigerants Used in the United States and their Climate Impact Relative to Carbon Dioxide*



*Global Warming Potentials (GWPs) are based on the 100-year direct GWPs provided in the Intergovernmental Panel on Climate Change Fourth Assessment Report (2007).

Where Are HFCs Used in the Federal Sector?

HFCs are found in a wide variety of applications used by federal agencies, including:

- Building and room air-conditioning (refrigerant)
- Motor vehicle air-conditioning (refrigerant)
- Large commercial food refrigeration systems (refrigerant)
- Refrigerators and freezers (refrigerant and foam)
- Dehumidifiers (refrigerant)
- Vending machines (refrigerant)
- Water coolers (refrigerant)
- Building insulation (foam)
- Fire extinguishing systems (fire suppressant)
- Aerosols and cleaning solvents for electronics, aircraft, and optical equipment
- Aerosol/computer keyboard dusters

These equipment or product types can be found in federal offices, warehouses, hospitals, housing units, and other buildings, as well as in the vehicle fleet.

What Are the HFC Reporting Requirements for Federal Agencies?

Federal agencies must report annually an inventory of absolute GHG emissions for the preceding fiscal year to the White House Council on Environmental Quality Chair and the Office of Management and Budget Director. Agencies must conduct all GHG reporting and inventories in accordance with the CEQ Guidance and the latest Technical Support Document. Currently, the Federal Greenhouse Gas Accounting and Reporting Guidance[1] and Technical Support Document[2] provide ways to estimate emissions of HFCs from the refrigeration/AC sector.

In 2010, federal agencies reported HFC emissions of nearly 2.2 million metric tons of carbon dioxide equivalent, with five agencies accounting for 98% of reported emissions (Department of Defense, Department of Energy, Tennessee Valley Authority, National Aeronautics and Space Administration, and United States Postal Service).[3]

What Should Agencies Consider in Their HFC Reporting?

When developing annual GHG emission inventories, federal agencies should consider a broad list of equipment that commonly emit HFCs. This equipment includes:

- Motor vehicle air conditioning systems
- Stationary AC systems (e.g., chillers, commercial unitary AC systems and packaged terminal AC systems)
- Small commercial refrigeration systems found in cafeterias (e.g., plug-in display cases, glass door bottle coolers, and ice cream freezers and condensing units)
- Large commercial refrigeration systems found in commissaries (e.g., condensing units and rack systems)
- Domestic refrigerators

Other sources may also be considered as appropriate and feasible, such as aerosol products, solvents, fire suppression, and explosion inerting.

How Are HFCs Being Addressed in the United States?

The President's 2013 **CAP**[4] makes phasing down HFCs a national priority. President Obama calls on his Administration to purchase cleaner alternatives to HFCs whenever feasible and transition over time to equipment that uses safer and more sustainable alternatives. The CAP also directs EPA to use its authority under the **Significant New Alternatives Policy (SNAP) Program** to identify and approve climate-friendly alternatives while prohibiting certain uses of the most harmful chemical alternatives. The United States established the SNAP Program in 1994 to evaluate and regulate substitutes for the ODS that are being phased out under Title VI of the Clean Air Act Amendments of 1990. The SNAP Program has reviewed over 400 substitutes—including HFCs—for the following industrial sectors: refrigeration & air conditioning; foam; solvent cleaning; fire suppression & explosion protection; aerosols, sterilization; and adhesives, coatings & inks.

To support the CAP, the Obama Administration announced **new executive actions** in September 2014 to promote the use of safer alternatives to HFCs and encourage the development of and investment in new technologies in the Federal sector. For example, the U.S. General Services Administration (GSA) is inviting technology manufacturers and industry stakeholders,

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[1] Executive Office of the President. 2012. "Federal Greenhouse Gas Accounting and Reporting Guidance". Available at: http://www.whitehouse.gov/sites/default/files/microsites/ceq/revised_federal_greenhouse_gas_accounting_and_reporting_guidance_060412.pdf.

[2] Executive Office of the President. 2012. "Federal Greenhouse Gas Accounting and Reporting Guidance: Technical Reporting Guidance". Available at: http://www.whitehouse.gov/sites/default/files/federal_greenhouse_gas_accounting_and_reporting_guidance_technical_support_document.pdf.

[3] Data.gov. 2011. "FY2010 Federal Government Greenhouse Gas Inventory by Agency". Metadata date April 28,2011. Accessed December 27, 2013. Available at http://www.whitehouse.gov/administration/eop/ceq/sustainability/fed-ghg. Data.gov and the Federal Government cannot vouch for the data or analyses derived from these data after the data have been retrieved from Data.gov.

[4] Executive Office of the President. 2013. "The President's Climate Action Plan". Available at: http://www.whitehouse.gov/sites/default/files/image/president27sclimateactionplan.pdf.

including those that offer HFC alternatives, to submit information on innovative and transformational building technologies that can be used in Federal buildings through its **Green Proving Ground (GPG)** program. The GPG program leverages GSA's real estate portfolio as a "proving ground" to evaluate emerging building technologies that promise to improve the environmental performance of GSA's portfolio while reducing operational costs. Technologies selected by the program will be matched with Federally-owned buildings and evaluated to inform public- and private-sector investment decisions and accelerate the commercialization and adoption of such technologies within the Federal Government. Similarly, the U.S. Department of Energy (DOE) is providing new funding for research and development into next generation cooling technologies to reduce energy use and replace HFC refrigerants in U.S. buildings.

Executive Order 13693 on *Planning for Sustainability in the Next Decade* includes various energy and sustainability requirements for agencies and departments within the Federal Government. This Executive Order sets greenhouse gas emission reduction targets and requires annual federal GHG inventory reporting for domestic source emissions and the tracking of such emissions relative to reduction targets.

How Can Emissions Be Reduced in the Federal Sector?

HFC emission reduction strategies in the federal sector can include, but are not limited to:

- Purchase of new equipment containing climate-friendly alternatives to HFCs
- The prevention and repair of leaks through improved service and maintenance
- End of life management and disposal programs
- Retrofitting of existing equipment with alternative refrigerants

A proposed amendment to the **Federal Acquisition Regulation (FAR)** was designed to implement the Executive branch policy in the CAP to procure, when feasible, alternatives to high-GWP HFCs. The proposed amendment aims to promote the use of safer chemical alternatives to HFCs among service and vendor contractors, by relying on EPA's SNAP program to identify safe alternatives for HFCs, including chemicals with lower GWPs and non-chemical or "not-in-kind" alternatives (e.g., pump sprays instead of aerosol cans, aqueous cleaning instead of solvent cleaning). To help agencies monitor progress, the proposed amendment will require contractors to keep track of and report on the amounts of HFCs added or removed during routine maintenance, repair, and disposal of all government equipment, appliances, and supplies.

Case Study: Lackland AFB Commissary

In 2014 the Defense Commissary Agency (DeCA) is retrofitting the refrigeration system at its 117,000 square foot commissary in San Antonio, Texas with an ammonia (NH3)/carbon dioxide (CO_2) cascade system. This system was selected in lieu of an HFC refrigeration system in order to control future capital and operating costs and help meet its energy and sustainability goals. Compared to the previous R-404A system, the new system is expected to reduce refrigerant and maintenance costs by 90% and 40%, respectively.

For more information and references, please see www.epa.gov/ozone/snap/.

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